conveyor into the pin elevator thereby reducing the setup time of bowling pins.

It is a further object of the invention to provide the user a device that eliminates the expense and danger of using hazardous cleaning materials and eliminates the time required by a mechanic to clean the ball return wheel.

It is another object of the invention to provide the user a device that reduces mechanical downtime thereby saving the expense of replacing expensive bearings on rollers and pulleys.

It is a further object of the invention to provide the user a field upgrade kit to slow down the automatic bowling machinery to facilitate smoother operation and provide longer machinery lifetimes.

Further objects are implicit in the detailed descriptions which follows hereinafter (which is to be considered as exemplary of, but not specifically limiting, the present invention) and said objects will be apparent to persons skilled in the art after a careful study of the detailed descriptions which follows.

For the purpose of clarifying the nature of the present invention, one exemplary embodiment of the invention is illustrated in the hereinbelow-described figures of the accompanying drawing and is described in detail hereinafter. It is to be taken as representative of the multiple embodiments of the invention which lie within the scope of the invention.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view showing one exemplary embodiment of one representative form of the invention.

FIG. 2 is a perspective view showing one exemplary embodiment of one representative form of the invention.

FIG. 3 is another perspective view showing one exemplary embodiment of one representative form of the invention.

FIG. 4 is a perspective view of a bowling ball retriever.

FIG. 5 is another perspective view of the bowling ball retriever.

FIG. 6 is yet another perspective view of the bowling ball retriever.

## DESCRIPTION OF THE PREFERRED EMBODIMENTS

Referring to FIG. 1. Bowling ball retriever **1** is a positive contact singularity base, that is to say, it is a one piece contact device having no moving parts. Ball retriever **1** is secured to the ball return wheel **6** with pop rivets **2**, however other means of securing or fastening may also be used. The bottom **7** of ball retriever **1** is configured convex to physically comply with the inside radius of the ball return wheel **8**, however that is not to say that another bottom configuration could be used if required by another form of fastening. The lead guide finger **9** of retriever **1** is designed to retrieve the ball, differentiating between ball and pin, to guide, capture and house the ball in its concave leading edge **10** for lift and delivery for subsequent discharge into a ball return. The ball, held in the radius of the lead guide finger **11** applies the correct amount of pressure against the back ball lift rod **12** eliminating the need for the rubber friction compensator. The leading edge **13** of ball retriever **1** is of a particular radius, however, other shapes or radii could also be used. The top trailing edge **14** of ball retriever **1** is of a angle for easy deposit of the ball into the ball return at the top of the ball lift, however another shape or angle could also be used. Ball retriever **1** eliminates the need for the manufacture to friction compensate the ball return system by operating at 36 r.p.m, this inventor suggests that the bowling machinery be now operated at a lower r.p.m. by using belt and pulley reduction, however, other means of speed reduction may also be used. Elongated front angled edge **3** expedites the separation of the bowling ball and bowling pins for a faster ball return system. The second angle top rear **4** facilitates easier discharge of bowling ball onto the ball return rails **15**. Recess **5** secures the bowling ball for delivery to the ball return rails **15**. Impact cushion **16** is attached to the impact sides of ball retriever **1** with adhesives however that is not to say that other means of fastening may also be used, the function of impact cushion **16** is to assist in diverting the ball and to lesson the stress placed on the fasteners **2** used to attach the ball retriever device **1** to the ball return wheel **6**. Ball protector lip **17** insures against ball damage due to occasional high speed impact, ball protector lip **17** is shaped by the forming process of ball retriever **1**, however other means of ball protection may also be used. One or more impact cushions (**16**) or other configurations and compositions may also be used however that is not to say that other means of bowling ball protection may also be used.

What is claimed is:

1. An automatic pinsetter bowling machine comprising;

a set of back ball lift rods (12);

a set of bowling ball return rails (15),

a ball return wheel (6) for moving a bowling ball along the lift rods (12) and discharging the bowling ball into said return rails (15),

a retriever device (1) secured to said wheel and including a base presenting a concave recess (5) for engaging a ball and moving the ball about said lift rods (12),

said retriever device including a lead guide finger (9) disposed forwardly of said recess (5) for separating pins out of said wheel.

2. A machine as set forth in claim **1** wherein said lead guide finger (9) has a front angled edge (3) and is angled upwardly from said front angled edge (3) for guiding pins away from said wheel while guiding balls into said concave recess (5).

3. A machine as set forth in claim **2** wherein said front angled edge (3) of said lead guide finger (9) is disposed between the sides of said concave recess (5) with said concave recess (5) having a leading edge (13) adjacent said front angled edge (3).

4. A machine as set forth in claim **3** including a concave leading edge (10) extending between said leading edge (13) of said recess (5) and said lead guide finger (9).

5. A machine as set forth in claim **4** wherein said recess (5) includes a top trailing edge (14) rounded for facilitating discharge of a said ball into said return rails (15).

6. A machine as set forth in claim **5** wherein said top trailing edge (14) leads into an angled top rear (4).

7. A machine as set forth in claim **6** including an impact cushion (16) disposed on said angled top rear (4).

8. A machine as set forth in claim **2** wherein said lead guide finger (9) has a radius (11) for cradling a ball against said back ball lift rod (12).

9. A retriever device for guiding a bowling ball against a ball return rails when disposed on a ball return wheel, said device comprising;

- a retriever device (1) including a base presenting a concave recess (5) for engaging a ball and moving the ball,
- said retriever device including a lead guide finger (9) disposed forwardly of said recess (5) for separating pins while retaining balls.

**10.** A machine as set forth in claim **9** wherein said lead guide finger (9) has a front angled edge (3) and is angled upwardly from said first angled edge (3) for guiding pins away while guiding balls into said concave recess (5).

**11.** A machine as set forth in claim **10** wherein said front angled edge (3) of said lead guide finger (9) is disposed between the sides of said concave recess (5) with said concave recess (5) having a leading edge (13) adjacent said front angled edge (3).

**12.** A machine as set forth in claim **11** including a concave leading edge (10) extending between said leading edge (13) of said recess (5) and said lead guide finger (9).

**13.** A machine as set forth in claim **12** wherein said recess (5) includes a top trailing edge (14) rounded for facilitating discharge of a said ball.

**14.** A machine as set forth in claim **13** wherein said top trailing edge (14) leads into an angled top rear (4).

**15.** A machine as set forth in claim **14** including an impact cushion (16) disposed on said angled top rear (4).

**16.** A machine as set forth in claim **10** wherein said lead guide finger (9) has a radius (11) for cradling a ball.

* * * * *